

Operating Instructions

Adsorption Dryer CTT 300

Colortronic GmbH

Otto-Hahn-Straße 10-14
D-61381 Friedrichsdorf

Telephone (0 61 75) 7 92-0
Telefax (0 61 75) 7 92-1 79
Email ctde@colortronic.com

USA

Colortronic, Inc.

VPR Commerc Center, Suite 406/407
1001 Lower Landing Road
Blackwood, NJ 08012

Telephone (609) 374-9200
Telefax (609) 374-9311
Email ctusa@colortronic.com

Technical service:

Service department

Telephone: **(0 61 75) 7 92-2 22**
Telefax: **(0 61 75) 7 92-1 19**
Email service.d@colortronic.com

Spare parts department

Telephone: **(0 61 75) 7 92-3 33**
Telefax: **(0 61 75) 7 92-1 08**

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This operation manual is for:

* Please fill in personally

Serial number: _____

Built in: _____

Date of delivery: _____

Number of delivery: _____

Date of commissioning: _____

Location: _____

Group of machines: _____

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1. Safety instructions

Version: 64.10-0127GB01 10/97



These safety instructions apply to all persons within the range of action of the equipment.

Please inform all persons within the range of action of the equipment of the direct and indirect hazards connected with the equipment.

These operating instructions are to be used by all persons assigned activities connected with the equipment.

Knowledge of the English language is prerequisite.

Ensure in each case that the operating personnel are familiar with the operating instructions and the function of the equipment.

1.1. Warnings and symbols

The following warnings and symbols are used in these operating instructions:



This symbol indicates danger to life! Fatal or serious injury is possible if the corresponding instructions, regulations or warnings are not observed.



This symbol indicates that serious injury is possible if the corresponding instructions, regulations or warnings are not observed.



This symbol indicates that extensive damage to equipment is possible if the corresponding instructions, regulations or warnings are not observed.



This symbol indicates information important for becoming familiar with the equipment, i.e. technical correlations.



This symbol indicates that a technical term is explained at this point.

1.2. Explanations and information

Various terms and designations are used in these operating instructions to ensure clarity. Therefore please note that the terms used in the text stand for the corresponding explanations listed below.

- **Equipment**
"Equipment" can mean an individual unit, a machine or an installation.
- **Operating personnel**
The "operating personnel" are persons operating the equipment on their own responsibility or according to instructions.
- **Operator**
The "operator" of the equipment (production manager, foreman, etc.) is the person responsible for all production sequences. The operator instructs the operating personnel of what is to be done.
- **Operating instructions**
The "operating instructions" describe the interaction of the equipment, production sequences or methods. The operating instructions must be compiled by the operator of the equipment.
- **Equipment foreman**
When several operating personnel work on one machine, the "equipment foreman" coordinates the sequences. The equipment foreman must be appointed by the operator.
- **Trained personnel**
"Trained personnel" are persons who, due to their training, are authorized to carry out the required work.

1.3. For your safety

- The operator of this machine must be at least 16 years old.
- Read these operating instructions carefully before the initial start-up. Observe all points. Contact us if anything is unclear.
This avoids injury and damage to equipment!
- These instructions must be stored in such a way that they are available at all times at the place of operation of the machine.
Danger of accidents arising through improper use!
- Please note that for reasons of clarity not every conceivable case of operation or of maintenance can be taken into consideration.
- Observe all safety and hazard warnings on the equipment.
This avoids injury and damage!
- Allow all work on the machine to be carried out only by persons whose qualifications are set out in the relevant chapters of the operating instructions.
Danger of accidents from improper use!
- For all work carried out on the equipment only the prescribed working clothes should be worn.
This avoids injury!
- Compare the electric supply values with those of the mains supply.
Danger of accidents from electric shock!
- When using lifting gear, please observe the relevant regulations.
Danger of accidents!
- Please note that all installation, start-up and maintenance work is to be carried out only by qualified, trained staff.
Danger of accidents from improper use!

- The local regulations and requirements pertaining to the equipment must be observed.
- The "5 safety rules" as provided in DIN VDE 0105, Section 1, must be observed for all work carried out on the equipment.
- Disconnect electrical components from the mains supply before work is carried out on these components.
Danger to life and limb from electric shock!
- Do not modify, add other equipment or change the design of the equipment without the approval of the manufacturer.
Danger of accidents!
- Compile detailed operating instructions based on the operating instructions supplied for the sequence of procedures to be carried out on this machine.
Danger of accidents from improper use!
- Appoint a machine foreman to be responsible for the machine.
- Ensure that the operating staff are thoroughly trained in the operation of the equipment.
Danger of accidents from improper use!
- If the machine is switched off for safety reasons, it must be secured against unauthorised activation.
Danger of accidents!
- Before starting maintenance work, appoint a supervisor.
- Inform the staff responsible before starting maintenance work.
Danger of accidents!
- Disconnect the equipment from the mains supply before starting maintenance work to ensure that it cannot be switched on accidentally.
Danger of accidents!

- Repair work may be carried out only by trained staff.
Danger of accidents!
- Never operate the equipment when it is partly dismantled.
Danger! Limbs may be caught in machinery! Electric shock!
- The machine may only be operated when all the associated components are properly connected up and in accordance with the relevant regulations.
- In case of malfunction, shut down the equipment immediately. Have faults corrected immediately.
Danger of accidents!
- The machine is intended only for the drying of granulated plastics. Any other or additional use is contrary to specifications.
- This machine is not suitable for food-drying.
- Please note that sound levels exceeding 85 db(A) may in the long term damage your health. Use the appropriate ear muffs.
This avoids impairment of hearing!
- Attachments not supplied by Colortronic must be manufactured in accordance with safety regulation EN 294.
Danger of accidents!
- Depressurize all system sections of the equipment before carrying out any repair work.
Caution: Danger of accidents!
- All pipes, hoses and screwed connections should be checked regularly for leaks and damage. Any faults which arise should be corrected immediately.
Danger of accidents!
- The safety instructions of the connected machines must be followed.

- The air filters should only be cleaned/replaced when the the main switch is off and the blower has stopped.
This avoids injury and damage to equipment!
- Never operate the dryer without side panels.
Danger: Limbs may be caught in machinery! Injury through burns!
- Check the v-belts of the blower only when the main switch is switched off and the blowers have stopped.
Caution: Danger of accidents!
- When drying plastics which emit gases dangerous for human health, take care that the regeneration exhaust air is disposed of without polluting the environment.
- Observe that the control system is still under voltage even when the main switch is switched off.
Caution: Danger to life through electrical shock!
- Please note for installation that the equipment is top-heavy.
Danger exists that it may topple over!
- Open drying hoppers only if they are completely empty.
Danger of accidents!
- Never open drying hoppers while the device is in operation.
Danger: Injury through burns!
- Open drying hoppers only if they have been cooled down sufficiently.
Danger: Injury through burns!
- Remove any granules remaining on the ground.
Danger of accidents!
- Arrest the wheels after installation if the dryer is mounted on a movable frame.
This will prevent danger to people and material!

- Take care that the device is not standing on the mains cable.
This will prevent danger to people and material!
- Please note that the drying cells, drying hoppers and air pipings grow hot during use. Avoid touching any of these parts!
Danger: Injury through burns!

1.4. For the safety of the devices

- Never change settings without carefully assessing the consequences.
- Use only original Colortronic spare parts.
- Observe the maintenance instructions.
- Keep a record of all maintenance works and repairs.
- Please note that electronic components can be damaged by static discharge.
- Before initial operation and in regular intervals, make sure that no electrical connections are loose.
- Never readjust sensors without exactly knowing their functions.
- Please ensure that the permitted storage temperature lies between -20 and +55 °C (-4 to +131 °F).
- Please ensure that the permitted operation temperature lies between 0 and +45 °C (32 to +113 °F).
- Check the direction of rotation of the blowers after the electrical connections have been made (see rotational direction arrow).
- Clean the drying hoppers before the first filling.
- Note the instructions of the material manufacturer for the maximum drying temperature.
- Note the drying instructions of the material manufacturer.
- Take care that the drying hoppers are always completely filled and that the retention period is respected if continual removal is taking place.

- Note that too large amounts taken from the drying hopper lead to insufficient drying of the material.
- Close the air stop valves of drying hoppers which are empty or have not been used.
- Note down all data which you have entered into the control system.
- The password is to be entrusted to authorised personnel only.
- Please note that the temperature of the dryer heating system must always be set lower than that of the supplementary heaters.
- When you dispose of drying agents, observe all official rules.
- Note that drying cells are replaced or refilled by Colortronic only if they are empty.
- The material level may not fall below 40 % in the drying hopper, when material is continuously removed from the drying hopper, but no material is continuously fed into the drying hopper (batch drying). Close the throttle valves.
- Read the operating manuals of the connected devices.

2. Assembly instructions

Version: 64.10-0128GB02 10/97



These installation instructions are intended for persons with skills in electrical and mechanical areas due to their training, experience and received instructions.

Personnel using these installation instructions must be instructed in the regulations for the prevention of accidents, the operating conditions and safety regulations and their implementation.

Ensure in each case that the personnel are informed.

The installation instructions provided in the corresponding operating instructions apply for all connected equipment.

Observe safety regulations with regard to lifting gear handling

All installation work must be carried out with the equipment disconnected from electrical power and compressed air supply.



For installation work taking place at heights of over approx. 6 feet, use only ladders or similar equipment and working platforms intended for this purpose. At greater heights, the proper equipment for protection against falling must be worn.

Use only suitable lifting gear which is in proper working order and load suspension devices with sufficient carrying capacity. Do not stand or work under suspended loads!

Use suitable workshop equipment.



Install the equipment such that all parts are easily accessible; this facilitates maintenance and repair work.

2.1. Transport

Only use for transport of the dryer a suitable hoist (e. g. a fork lift truck or a workshop crane).



Please ensure adequate carrying capacity of the lifting gear.
Observe dryer weight!

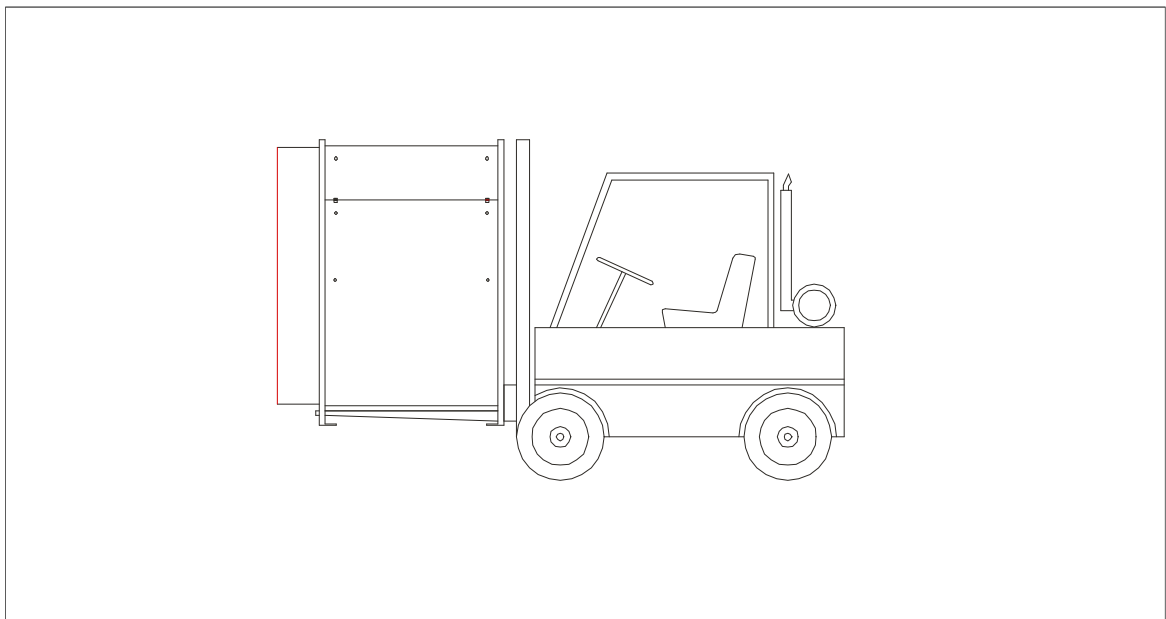
Note that the dryer system is top-heavy. Risk of toppling!

Please observe all safety regulations for the operation of lifting gear.

with a fork lift truck

Push the forks up to the dryer housing.

Check that the forks reach completely under the dryer housing.



Transport with a fork lift truck

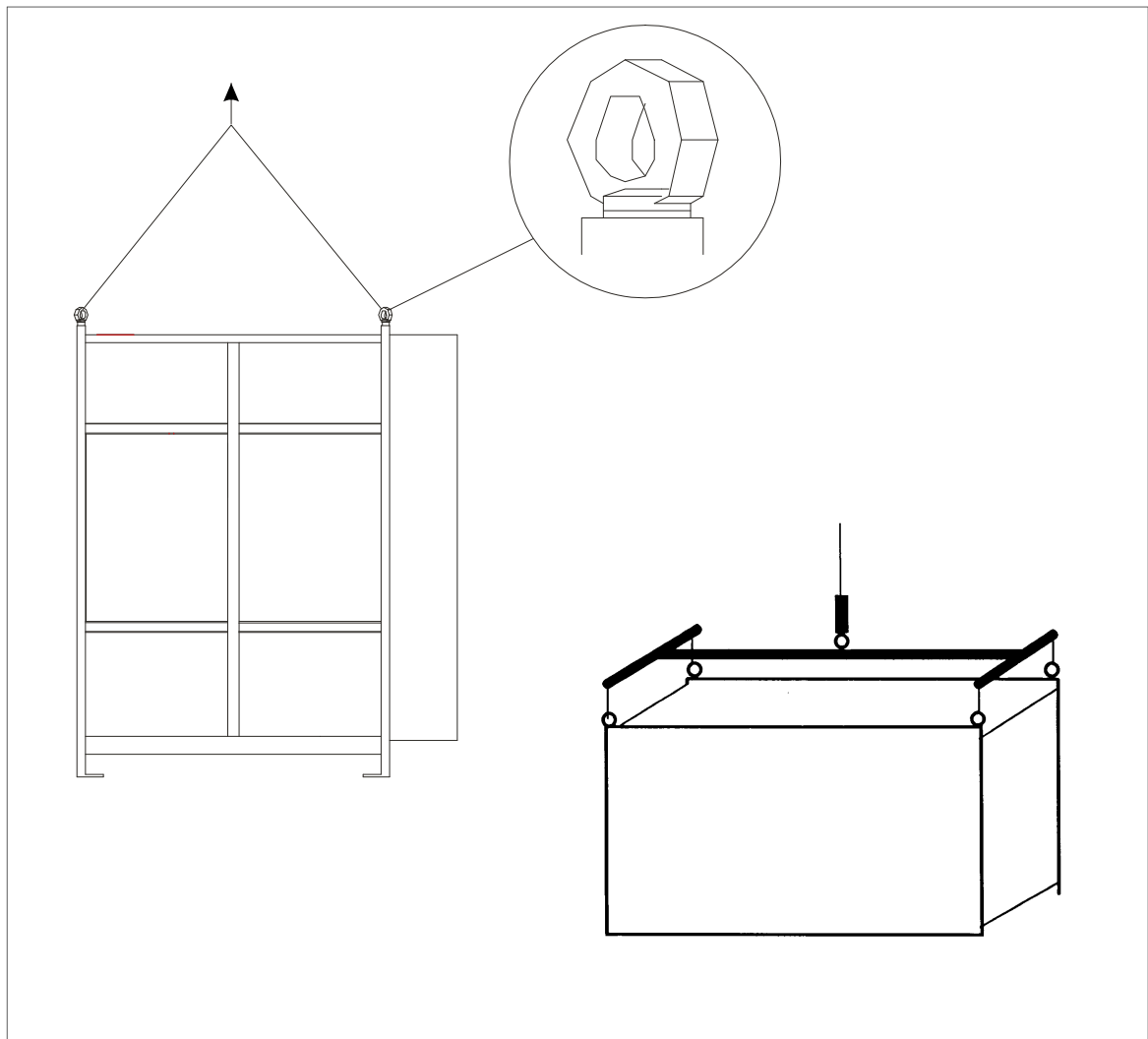
with a workshop crane

Check if the eyelets are installed on the dryer housing.

If this condition is met, fasten the transport cables to the eyelets.

If this condition is not met, mount the eyelets and then fasten the transport cables to the eyelets.

Disassemble the eyelets after set-up.



Transport with a workshop crane

2.2. Set-up

A special foundation is not required for installation.

The dryer must be installed on a level surface, and may not be exposed to excessive humidity. Maximum permissible ambient temperature of the control system is 45°C.

To facilitate servicing, install the dryer such that it is accessible from 3 sides. Make sure that the air filters can be changed without problems. The rear of the dryer can be placed against a wall.



The main switch must be freely accessible.

To conserve energy, keep the distances between dryer, hopper and processing machine as short as possible.

2.3. Mounting of the suction device for regeneration exhaust air

When plastics are dried which produce hazardous gases, environmentally sound disposal of the regeneration exhaust air must be provided. The throughput of the regeneration blower may not be changed.

It must be taken into consideration when installing a disposal system (e.g. exhaust system) that regeneration exhaust air is extremely humid. This may result in condensation water which must not enter the dryer again under any circumstances.

2.4. Connection of the return air cooler (optional)



A return air cooler is generally required in cases in which the return air temperature is over 65°C.

The return air cooler can be connected to a coolant circuit or the water mains network.

Observe the water flow with connection to water mains network. The coolant circuit must be dimensioned accordingly.

Remove the side panel of the dryer.

Connect the coolant intake line and coolant return line to the return air cooler.

Observe the flow direction of the coolant through the return air cooler.

Check the connections for leaks.

Mount the side panel.

2.5. Electrical connection



Observe the rules of the local electricity board.

Check that the supply voltage and the power frequency are in accordance with the data on the name plate of the device.

The electrical connection may only be carried through or assigned by Colortronic service staff or by qualified staff authorized by Colortronic.

Other persons are not permitted to carry through the electrical connection.



Observe that the control system is still under voltage even when the mains switch is switched off.



Regularly make sure that none of the electrical or screw connections are loose.

Immediately after connection, check the direction of rotation of the blowers (see rotational direction arrow on the blowers).

The direction of rotation should be switched in the supply line only.

The operation voltage is 400 V/3AC/PEN/50 Hz.
Special operation voltages are possible.

3. Functional description

Version: 64.10-0145GB01 03/98



This functional description is intended for all operating personnel of the equipment.

Prerequisite for this functional description is general knowledge of dryers and SPS systems.

Ensure in each case that the operating personnel are sufficiently informed.

3.1. Dryer

The dryer operates with dehumidified air, i.e. the air is not only heated but also dehumidified before flowing into the drying hopper. This principle allows plastic granules to be dried to a residual moisture content as low as 0.002 % (PET granulate).

The dew point temperature of the dehumidified air lies between -55°C and, depending on the set value, -35 to -28°C. The lower limiting value of the dehumidified air is about 80°C due to the intake of water in the drying cells.

The dryer operates continuously, i.e. dehumidified and, if necessary, heated air is produced continuously.



The dryer is designed for continuous operation.

The dryer operates with 2 drying cells; one of these cells is always in the drying cycle while the other is being regenerated (max. 60 min.).

The dew point temperature is monitored continuously. The valve system switches to the freshly regenerated drying cell only after the selected dew point temperature has been reached. The humid drying cell is then regenerated. After the cooling time the drying cell is ready for operation again. The valve system switches to the freshly regenerated drying cell only after the moisture content of the drying cell which is in the drying cycle has reached the setpoint value.

If a malfunction occurs in the drying cycle during the program run, regeneration is not interrupted, but continues until the program end has been reached. This guarantees that 1 regenerated drying cells is always available.

The air inside the switch cabinet is cooled by a cooling appliance for the protection of temperature-sensitive components (if present, optional).

With the digital timer the dryer can be switched on and off at set times.

3.2. Drying hopper (optional)

The material is dried in the drying hopper. The dehumidified air (2) is forced through the material in the hopper, collecting moisture in the process. The drying hopper must be dimensioned according to its intended use to ensure that the final moisture content is attained. When the hopper is filled for the first time or at the start of a drying procedure, the material in the hopper must be dried completely before material can be removed from the hopper for the first time.

When material is continuously removed from the hopper, material must also be continuously fed into the drying hopper. The new (moist) material is fed into the drying hopper from the top and slowly moves downward toward the material suction box. As the material moves upward, it is dried until its final moisture content is attained.

If several drying hoppers are connected to one dryer, the feed and return pipes are each equipped with a throttle valve by means of which air volume can be regulated. The feed opening and material temperature can be read at the control system (optional).

Flow indicators are available as auxiliary equipment; these allow comparison of the air flow in the individual drying hoppers.

To ensure proper continuous drying, we recommend that the drying hopper always is kept completely filled. Automatic conveyors, such as the models included in our delivery program, optimize the automation of the material flow.



When material is continuously removed from the hopper, but no material is continuously fed into the drying hopper (batch drying), the material level may not fall below 40 %. Close the throttle valves.

3.3. Return air cooler (optional)



A return air cooler is generally required in cases in which the return air temperature is over 65°C.

A return air cooler improves the efficiency of the drying cells.

The return air cooler reduces the return air temperature to a defined value. The return air temperature is set at the operation panel.



The lower the value chosen for the return air temperature, the better the efficiency of the drying cells.

The dryer is automatically switched off if temperature exceeds 80°C.

Return air temperature is continuously monitored; the return air cooler is activated only when needed. If the return air temperature exceeds the set value (e.g. due to interruption in the cooling water supply or soiling), an alarm message is given.

The return air cooler can be connected to a coolant circuit or to the water mains network.

3.4. Hopper heaters (optional)

If differing drying temperatures are required in the different drying hoppers, hopper heaters must be installed on the drying hoppers. The drying temperature of each drying hopper can be set centrally at the dryer.

3.5. Automatic motor flaps (optional)

Automatic motor flaps cut off the drying hopper from the drying circuit as soon as the material is completely dried. The supplementary heating system is also switched off. Dehumidified air flows into the drying hopper only after new, moist material is added to the hopper. This ensures that the material is not damaged, and saves a considerable amount of energy.

Temperature probes at the feed opening of the drying hopper and inside the drying hopper enable comparison of feed opening and material temperature, from which the drying degree of the material can be calculated.

If the drying hopper is to be cleaned or blocked, the motor flap can be closed via the dryer. The supplementary heating system is then automatically switched off.

3.6. Connection to a pneumatic conveying system (optional)

The dryer operates most effectively in conjunction with a pneumatic conveying system. This combination of dryer and conveying system ensures that sufficient material is always fed into the drying hopper.

Only the amount of material required for the processing machines used is removed from the hopper. This guarantees that the final drying result remains constant.

Colortronic drying hoppers are available equipped with the corresponding flange for connection of a Colortronic pneumatic conveyor directly ex works.

Suction boxes can also be delivered with the required number of suction tubes. These suction boxes were developed specially for this hopper to prevent dust and foreign particles from being aspirated into the system.

A device for connection to the dehumidified air supply line is also available. Please note that the function of this combination is different from that of the conventional Colortronic suction boxes.

If the suction box is located under the drying hopper, flow in the feed line is decreased by pulling out the suction tube. Conveying capacity is increased by pushing in the suction tube.

4. Start-up

Version: 64.10-0130GB04 03/98



This chapter is directed at the operators of the equipment.

This chapter assumes general skills in dealing with dryers and SPS systems.

This chapter assumes that the functional description has been read and understood.

It should be ensured in each and every case that the operators have the relevant skills.



Note down all set values of the control system.

Make sure that the cooling appliance is connected to the mains socket in the electrical cabinet (if present, optional).

Make sure that any condensate penetrating from the cooling appliance (optional) does not get inside the dryer or the control box.



If the inside temperature of the switch cabinet is above +50°C, the dryer is switched off after 30 minutes if it is operated with a cooling appliance (optional).

4.1. Control system

The control system is switched on at the main switch. The control system is operated via a "selection window" and the keyboard of the operator panel.

The facility's control system is factory-programmed. Nevertheless, you have to set specific values (basic parameters) which are dependent on the processed material, for instance.

The values entered are stored in the control system and remain so, even after the unit is switched off or in the event of a power cut. All messages are displayed in plain text.

In describing this start-up, we have assumed that the various sub-menus are selected from the "table of contents".

This structure of the description has been selected since, in most cases, you will only work on one item in the "submenu".

If you want to work on several "submenu" items in succession, you can select the individual items directly by means of the arrow keys.

The control system is designed for connection of one dryer, a maximum of 10 hopper heaters (optional), 10 motor flaps (optional), and one bypass flap (optional).

Dew point is monitored continuously; dew point temperature is displayed. Supplementary heating systems are operated directly via the dryer control system.

All heating systems are equipped with temperature limiters which reliably prevent overheating.

The control system is communication-capable (optional); a printer can also be connected (optional).

The individual states of operation are indicated by means of a flow chart with symbols and LED's.

4.1.1. Key assignment

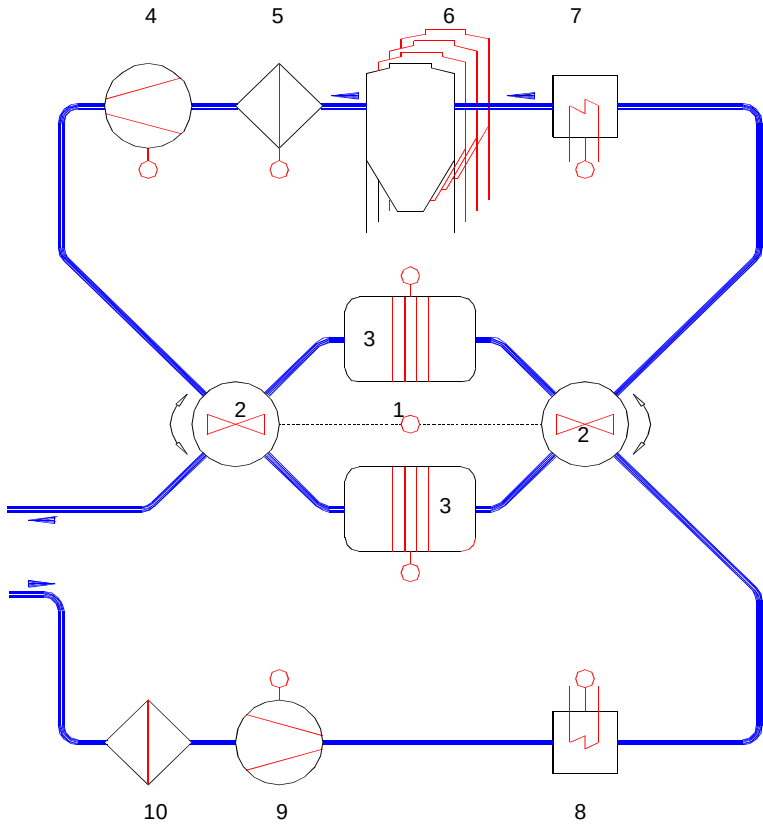
F1-key:	Leads to the table of contents.
ENTER-key:	Confirms the entries.
ESC-key:	Goes back one step in the menu.
ACK-key:	Activates an alarm message; to unblock the control system.
Arrow keys:	Move the cursor bar; switch the appliances on or off in combination with the SHIFT key; for scrolling forward or backward in a menu.
SHIFT-key:	Switches on the secondary functions of the keys, when the SHIFT-key has been pushed, the LED "SHIFT" is on.
HELP-key:	Viewing additional texts, when additional texts can be viewed the LED "HELP" is on.
LED "ALARM":	A failure is given by flashing of the LED "alarm". If the alarm message is acknowledged by pressing of the "ACK" key, but the failure is not yet eliminated, the flashing changes to steady light. When there is no failure the LED is off.



LED = light emitting diode

An additional alarm device (horn or lamp) can be connected (optional).

4.1.2. Flow chart



- 1 Indicator lamp
- 2 Valve system
- 3 Drying chamber
- 4 Drying blower
- 5 Return air filter
- 6 Drying hopper
- 7 Drying heater
- 8 Regeneration heater
- 9 Regeneration blower
- 10 Regeneration air filter

Indicator lamp messages:

Green continous light: in process
Red continous light: alarm

4.2. Switching on the dryer

Switch on the system by means of the main switch.



The control system carries through a self-test; after that, the name of the dryer and the operation status of the unit are displayed.



Unblock the control system:
Keep the ACK key pressed until the LEDs of the keys K1 - K4 light up.

4.2.1. Operation statuses

The following operation statuses can be displayed:

- system is off
- system is on
- blower runs on
- valve block
- regeneration will be finished in x min.

4.3. Initial operation



Before initial operation, all control data should be set back.



This work may be carried through only by qualified personnel trained in the field of electrical engineering.

4.3.1. Setting back the control data (Re-Setting)

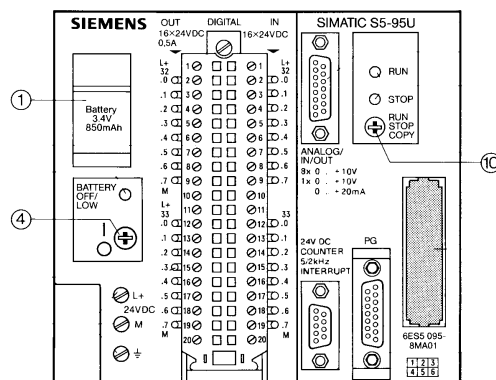
Open the control box by means of the control box key which is part of the supply.

Set the function selector (10) at "STOP" position.

Open the battery compartment (1) of the control system and take out the battery.

Set the on/off switch (4) at position "0".

Wait for approx. 30 seconds.



Control



All control data are set back to the standard settings.

Set the on/off switch (4) at position "1".

Insert the battery into the battery compartment (1).

Close the battery compartment (1).

Set the function selector (10) at "RUN" position.

Close the control box.



Unblock the control system:
Keep the ACK key pressed until the LEDs of the keys K1 - K4 light up.

4.4. Passwords

The entry of a password prevents unauthorised persons from having access to the data entered into the control system. Important data can then be entered or modified only after the password has been entered.

If you make no entries for more than 10 minutes, the access is blocked and you have to re-enter the password.

- password level 6: 79 21 54



Tell the password only to authorised persons.

4.5. Basic parameters

Press the "F1"-key.

4.5.1. Turning the devices on/off

Select "**Main menu**".

Acknowledge with the ENTER-key.

or

Press the "**F2**"-key.

Dryer on/off

"on" = turn dryer on,

"off" = turn dryer off.

Acknowledge with the ENTER-key.

Timer on/off

Press the SHIFT-key and choose with the arrow-keys the desired operation:

"internal" = operation with timer (operation at OP7, see chapter timer),

"external" = operation with timer (if present),

"off" = operation without timer.

Acknowledge with the ENTER-key.



The timer is only operating, when the dryer is switched on.

Drying Heater on/off (optional)

"on" = turn drying ht. on,

"off" = turn drying ht. off.

Acknowledge with the ENTER-key.

Return air cooler on/off (optional)

“on” = operation with return air cooler,

“off” = operation without return air cooler

Acknowledge with the ENTER-key.

Hopper X on/off (optional)

(X = number of the drying hopper)

“on” = releasing drying hopper X,

“off” = blocking drying hopper X

Acknowledge with the ENTER-key.

Hopper heater X on/off (optional)

(X = number of the hopper heater)

“on” = switch on hopper heater X,

“off” = switch off hopper heater X

Acknowledge with the ENTER-key.

Press the "F1"-key.

4.5.2. Entering dryer values

Select "**Dryer**".

Acknowledge with the ENTER-key.

or

Press the "**F3**"-key.

Drying Heater Target (optional)

Enter the drying temperature of the dryer.



Observe max. drying temperature of the dryer.

The drying temperature of the dryer must be selected so that it is the same as or higher than the desired hopper temperature.

Turn off the dryer heating system if a lower drying heat is entered.

Acknowledge with the ENTER-key.

Drying Heater Act. (optional)

The current drying temperature will be displayed.

Regeneration Heater Act.

The regenerated heat temperature will be displayed.

Used air Act.

The current temperature of the used air will be displayed.

Return air cooler Target (optional)

Enter the max. permissible return air temperature (65°C max.). Higher temperatures are not allowed.

Acknowledge with the ENTER-key.

Return air cooler Act. (optional)

The current return air temperature will be displayed.



The cooling effect of the return air cooler is highly dependent on the cooler circuit.

The lower the value chosen for the return air temperature, the better the efficiency of the drying cells.



Plan the size of the coolant circuit accordingly.

Dew point max.

Enter the maximum permissible (worst allowed) dew point temperature (-35 to 28°C).

Acknowledge with the ENTER-key.

Dew point Act.

The current dew point temperature will be displayed.



If there is a cable break "+0 °C" is displayed.

Press the "F1"-key.

4.5.3. Entering hopper values

Select "**Hopper**".

Acknowledge with the ENTER-key.

or

Press the "**F4**"-key.

Hopper entry X Target

(X = number of the drying hopper)

Enter the drying temperature for hopper flap X (when operating with supplementary heating).

Acknowledge with the ENTER-key.

Hopper entry X Act.

(X = number of the drying hopper)

The current temperature at the feed opening of hopper flap X will be displayed.



If there is a cable break "+0 °C" is displayed.



The lowest drying temperature setting of the hopper flap must be the same as or higher than the drying temperature.

Granules X

desired: _ % = _ °C

(X = number of the drying hopper)

Enter the material temperature at which the flap (optional) on the drying hopper X should close.



This value is entered in percent of the temperature on the hopper inlet.

The material temperature calculated by the control system for closing the flap on the drying hopper X is displayed in °C.

Confirm with the ENTER key.

Granules X

actual: _ °C

(X = number of the drying hopper)

The current material temperature in the drying hopper X is displayed in °C (optional, if there is a flap).

Granules X

dwelling time: _ min

The dwelling time of the material within the drying hopper X is displayed in minutes.



Observe the indicated dwelling time.



When the drying hopper is released, the dwelling time starts.
The residual time is displayed (= current dwelling time).

If the drying hopper is blocked, the current dwelling time is
reset to the value of the dwelling time which has been
entered before.

Press the "F1"-key.

4.5.4. Observing processing status

Select **"Status"**.

Acknowledge with the ENTER-key.

or

Press the **"K1"**-key.



The current operation status of individual assembly parts is displayed:

e.g.: valve block moved in/moved out/error

"moved in" = The upper drying cells are within the drying circuit; the lower ones are regenerated.

"moved out" = The upper drying cells are regenerated; the lower ones are within the drying circuit.

"error" = An error has occurred.

Other operation statuses:

"on" = in operation,

"off" = out of operation,

"open" = opened,

"shut" = closed.

Press the **"F1"**-key.

4.5.5. Setting date and time



This function is password protected.

Press the "**K3**"-key.
Enter the password if requested.

Date

Press the SHIFT key.
By means of the arrow keys, select the desired week-day.
By means of the arrow keys, select the shown date.
Press the SHIFT key.
Enter the desired date.
Press the ENTER key.

Time

Enter the desired time.
Press the ENTER key.

Press the "F1"-key.

4.5.6. Viewing/changing language and contrast



This function is password protected.

Press the “**K4**”-key.
Enter the password if requested.

Contrast

Press the SHIFT key.
By means of the arrow keys, select the adjustment which suits you best.
Press the ENTER key.



Depending on the outside temperature, the brightness of the screen may vary.

Language

Press the SHIFT key.
By means of the arrow keys, select the desired language (if present).
Press the ENTER key.

Press the “**F1**”-key.

4.5.7. Changing parameters

Select "**Parameters**".
Acknowledge with the ENTER-key.

or

Press the **SHIFT**-key and the "**K1**"-key.



The values in this menu may only be changed after contacting Colortronic Service.

Press the "F1"-key.

4.5.8. Setting the timer

Select "**Timer**".

Acknowledge with the ENTER-key.

or

Press the **SHIFT**-key and the "**F1**"-key.

XX ON 00:00 OFF 00:00 (XX = day Mo-Su)

Enter for each day the switching on time and the switching off time.

Acknowledge with the ENTER-key.



Example:

Fr	ON	08:00	OFF	23:59
Sa	ON	00:00	OFF	23:59
Su	ON	20:00	OFF	08:00
Mo	ON	00:00	OFF	00:00

The dryer starts on Friday at 08:00 in the morning, runs through without interruption until Sunday at 08:00 and switches off. At 20:00 the dryer starts again and switches off on Monday at 00:00.

Press the "F1"-key.

4.6. Recipes (optional)

Select "**Recipes**".

Confirm with the ENTER-key.

or

Press the keys "**Shift**" and "**F3**".

Hopper no. X (X = number of the drying hopper)

Enter the number of the drying hopper whose recipe you want to edit.

Confirm with the ENTER-key.



The hopper is displayed with the current recipe Y, Z (Y = recipe value range, Z = recipe number), drying temperature (°C) and dwelling time.

Press the "↓" key.



Recipes can be modified (stored/deleted), activated or printed.

4.6.1. Editing recipes

Edit

Press the "F2"-key.

Recipe range X (X = 1 - 4)

Select the recipe range.

Confirm with the ENTER-key.



99 recipes can be stored per recipe range.

During initial operation, no recipes are stored.

By means of the arrow keys "↓" or "↑", select the desired recipe or enter the desired recipe number.

Confirm with the ENTER-key.

Drying temperature

Enter the drying temperature in °C for the material in hopper X.

Confirm with the ENTER-key.

Dwelling time

Enter the dwelling time of the material in minutes.

Confirm with the ENTER-key.

Press the ESC-key.

4.6.1.1. Storing the recipe

No.

Enter a recipe number.

Confirm with the ENTER-key.

Name

Enter a name for the recipe.

Confirm with the ENTER-key.

Store data record? Y

Confirm with the ENTER-key if you want to save the recipe.

Press the ESC-key if you do not want to save the recipe.



If the recipe number has already been entered into the recipe memory, a security prompt is carried through.

4.6.1.2. Deleting the recipe

By means of the arrow keys “↓” or “↑”, select the desired recipe or enter the desired recipe number.

Press the “**DEL**”-key.

Delete?

Confirm with the ENTER-key if you want to delete the recipe.

Press the ESC-key if you do not want to delete the recipe.

Press the “F1”-key.

4.6.2. Activating the recipe

Press the keys "**Shift**" and "**F3**".

Hopper no. X (X = number of the drying hopper)

Enter the number of the drying hopper whose recipe you want to activate.

Confirm with the ENTER-key.

Press the "↓" key.

Transfer

Press the "F3"-key.

Recipe range X (X = 1 - 4)

Select the recipe range.

Confirm with the ENTER-key.

Source

Enter the recipe number or press the SHIFT-key and select the desired recipe by means of the arrow keys "↓" or "↑", respectively.

Confirm with the ENTER-key.



The name of the recipe is displayed.

Destination

Enter "0" if you want to activate the recipe.

Confirm with the ENTER-key.



Enter a number between 1 and 99 if you want to store the recipe under a new recipe number.

Assumption

Confirm with the ENTER-key in order to transfer the recipe to the control system.



When the recipe has been transferred, a "*" is displayed.

OP: X (X = 1 - 4)

The recipe range is displayed.

Press the "F1"-key.

4.6.3. Printing recipes



Make sure that a printer (optional) has been connected and is switched on.

Press the keys "**Shift**" and "**F3**".

Press the "↓" key twice.

Select the recipe range (1-4) and press the key "F2" (= recipe range 1 and 3) or "F3" (= recipe range 2 and 4), respectively.



The recipes are printed.

Press the "F1"-key.

4.7. Starting continuous operation

When you have carried through all basic settings, you can start with continuous operation.



For initial operation: set back the control data (Re-Setting and unblock the control system).

Make sure that hoppers which are not in use are separated from the dehumidified air supply.

Make sure that the set drying temperatures are suited for the materials in the hoppers.

After first filling, do not process the material until after the dwelling time.

If a return air cooler is installed, switch on the coolant circuit of the return air cooler.

Make sure that the cooling appliance is connected to the mains socket (if present, optional).

Check setting of the timer.

Select "**Main menu**".
Acknowledge with the ENTER-key.

or

Press the "**F2**"-key.

Select "**Dryer on**".
Acknowledge with the ENTER-key.

4.8. Alarm Messages



Alarm messages are displayed in plain language on the screen of the operator device.

The display of alarm messages in the operator device can only be erased by pressing the "ACK" key. The failure is not repaired.

A failure is given by flashing of the LED "alarm". If the alarm message is acknowledged by pressing of the "ACK" key, but the failure is not yet eliminated, the flashing changes to steady light.

If a cooling appliance is present: If the temperature inside the switch box is higher than +50 C, the lamp "alarm - temperature inside switch box" goes on. If the temperature is still too high after 30 minutes, the dryer is switched off.



Failures must be repaired immediately.

Press the "**K2**"-key.

View

Press the "F2"-key.

All alarm messages with their numbers (see Texts), date, time and the supplement "K", "G", or "Q" are displayed.



"K" = coming (a failure occurred)

"G" = going (the reason for the failure has gone)

"Q" = reset (the display of the alarm message in the operator device has been erased by pressing the "ACK"-key)

Press the ESC-key.

Print (Optional)



This function is password protected.



Make sure that a printer is connected and switched on.

Press the "F3"-key.

The alarm messages are printed.

Press the "↓" -key.

Number

Press the "F2"-key.

Total messages

The number of all alarm messages is displayed.

Waiting messages

The number of current alarm messages is displayed.

Press the ESC-key.

Delete

Press the "F3"-key.



This function is password protected (Colortronic service).

Press the ENTER-key for deleting the messages.

Press the ESC-key.

Press the "↓" key.

Overflow

Press the "F2"-key.



If there are more current alarm messages than can be saved, a warning message (= residual buffer reached) may be given.

This function is password protected (Colortronic service).

Overflow warning On/Off

Press the SHIFT-key.

By means of the arrow keys, select "on" if a warning message is to be given.

By means of the arrow keys, select "off" if no warning message is to be given.

Press the ENTER-key.

Press the ESC-key.

Text

Press the "F3"-key.

All possible alarm messages are displayed with their numbers (see Viewing).

For viewing the possible alarm messages, press the arrow keys:

PLC (= SPS) Battery is Empty

Replace the SPS battery.

Main Switch is Off

The main switch has been placed in the off position.

The safety temperature limiter of the drying or the regeneration heater, respectively, has been activated.

The safety temperature limiter of a hopper heater has been activated.

Error valve block.

Check the safety temperature limiter.

Check the position of the valve block.

A Safety Temperature Limiter has been Activated

Check the safety temperature limiter of the drying, regeneration, or hopper heater, respectively.

Filter Door is Open

The side panels to the air filters are open.

Assemble side panels.

The Safety Switch Regeneration Blower Has Been Actuated

Check the blower.

Check the fuses.

Short circuit check of the blower.

Vacuum Regeneration Blower

The regeneration blower does not produce sufficient pressure.

Check the blower.

Vacuum sensor defective.

The Safety Switch Drying Blower Has Been Actuated

Check the blower.

Check the fuses.

Short circuit check of the blower.

Vacuum Drying Blower

The drying blower does not produce sufficient pressure.

Check the blower.

Vacuum sensor defective.

Temperature Measurement Regeneration Heater Defective

Check the cables and the sensor.

Check the power supply.

Short circuit check.

Excess Temperature Regeneration Heater

The regeneration temperature is too high.

Check the safety temperature limiter.

Colortronic Service.

Insufficient Temperature Regeneration Heater

The regeneration temperature is too low.

Check the regeneration heater.

The Safety Switch Regeneration Heater Has Been Actuated

Check the heater.

Check the fuses.

Short circuit check of the heater.

Error Bypass Flap

The bypass flap does not close or closes too slowly.

Check the bypass flap.

Error Valve Block

The valve block has not reached the proper position. The main switch is placed in the off position.

Check the position of the valve block. Press the "ACK" key and put the main switch in the on position immediately. If the valve block has not reached the correct position within 1 minute, the main switch is again placed in the off position.

Colortronic Service.

Temperature Measurement Outgoing Air Defective

Check cables and sensor.

Temperature Measurement Return Air Defective

Check cables and sensor.

Excess Temperature Return Air

Check cables and sensor.

Check the return air cooler.

Temperature Measurement Drying Heater Defective

Check cables and sensor.

Check the power supply.

Short circuit check.

Excess Temperature Drying Heater

The drying temperature is too high.

Check the safety temperature limiter.
Colortronic Service.

Insufficient Temperature Drying Heater

The drying temperature is too low.

Check the drying heater.

Safety Switch Drying Heater

Check the heater.
Check the fuses.
Short circuit check of the heater.

Temperature Measurement Heater Defective Hopper X

(X = number of the drying hopper)

Check cables and sensor.
Check the power supply.
Short circuit check.

Excess Temperature Heater Hopper X

(X = number of the drying hopper)

The temperature of the hopper heater is too high.

Check the safety temperature limiter.
Colortronic Service.

Insufficient Temperature Heater Hopper X

(X = number of the drying hopper)

The temperature of the hopper heater is too low.

Check the hopper heater.

Safety Switch Heater Hopper X

(X = number of the drying hopper)

Check the heater.

Check the fuses.

Short circuit check of the heater.

Temperature Measurement Granules Defective Hopper X

(X = number of the drying hopper)

Check cables and sensor.

Check the power supply.

Short circuit check.

Excess Temperature Granules Hopper X

(X = number of the drying hopper)

The material temperature is too high.

Check the heater.

Check the throttle valve.

Valve Error Hopper X

(X = number of the drying hopper)

The throttle valve does not close or closes too slowly.

Check the throttle valve.

Press the "F1"-key.

4.9. Viewing system runtime

Select "**System runtime**".
Acknowledge with the ENTER-key.

or

Press the **SHIFT**-key and the "**F2**"-key.

System runtime
XX h YY min



The runtime of the blowers is shown in hours and minutes.

4.10. Switching the dryer off

Select "**Main menu**".

Acknowledge with the ENTER-key.

or

Press the "**F2**"-key.

Select "**Dryer off**".

Acknowledge with the ENTER-key.



Wait until the regeneration phase is finished and the blower has come to a standstill.

Switch off the dryer at the main switch.

Disconnect the power supply.



Never switch off the dryer directly at the main switch.

5. Maintenance

Version: 64.10-0146GB01 03/98



This chapter is intended for persons with skills in electrical and mechanical areas due to their training, experience and received instructions.

Personnel using the instructions in this chapter must be instructed of the regulations for the prevention of accidents, the operating conditions and safety regulations and their implementation.

Ensure in each case that the personnel are informed.

For maintenance work taking place at heights of over approx. 6 feet, use only ladders or similar equipment and working platforms intended for this purpose. At greater heights, the proper equipment for protection against falling must be worn.

Use only suitable lifting gear which is in proper working order and load suspension devices with sufficient carrying capacity. Do not stand or work under suspended loads!

Ensure that the electric motors/switch cabinets are sufficiently protected against moisture.

Use only suitable workshop equipment.

Before starting maintenance work, appoint a supervisor.

Inform the responsible personnel before maintenance work on the system is started.

Never operate the equipment when partially dismantled.

All maintenance and repair work **not** described in this chapter, may only be carried out by Colortronic service personnel or authorized personnel (appointed by Colortronic).



Disconnect the equipment from mains supply before starting maintenance procedures to ensure that it cannot be switched on unintentionally.

Depressurize all compressed air piping of the equipment before starting maintenance work.



Please observe the maintenance schedule.

Before starting maintenance work, clean the equipment of oil, fuel or lubricants.

Ensure that materials and incidentals required for operation as well as spare parts are disposed of properly and in an environmentally sound manner.

Use only original Colortronic spare parts.

Keep record of all maintenance and repair procedures.

5.1. Maintenance intervals

Daily:	Check warning signs on equipment for good legibility and completeness Clean return air filter and housing (depending on amount of dust collected) Lamp test: if you press the "+/-"-button longer than 2 seconds all LED's must light up
Weekly:	Check function of the main switch Clean filter of the electrical cabinet (depending on amount of dust collected)
Monthly:	Check V-belt tension of blower
Every three months:	Clean filter of the regeneration blower (depending on amount of dust collected)
Every six months:	Exchange return air filter (depending on amount of dust collected) Exchange filter of the electrical cabinet (depending on amount of dust collected) Check all electrical and mechanical connections for tight fit.
Yearly:	Exchange filter of the regeneration blower (depending on amount of dust collected)



This maintenance schedule is calculated for 3-shift operation.



The given maintenance intervals are average values. Check whether in your individual case the maintenance intervals must be shortened.

5.2. Cleaning/renewing the air filters

Press the "**F2**"-key.

Select "**Dryer off**".

Acknowledge with the ENTER-key.



Wait until the blowers have stopped turning.

Switch off the dryer at the main switch.

Disconnect the power supply.



Open the upper left-hand panel (seen from the front) by means of the provided switch cabinet key.



Clogged filters reduce the volume of circulating air to a substantial degree and result in decreased dryer efficiency. In addition, the heating elements may be damaged due to clogged filters.

Return air filter

Loosen the securing nut on the return air filter housing and remove the housing lid.

Remove the return air filter.

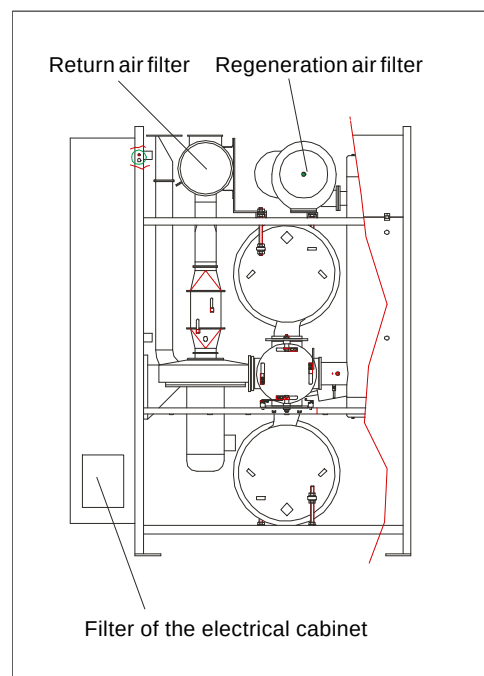
Clean the return air filter with compressed air from inside to out **or** renew the filter. Never knock the return air filter on the floor.

Clean the return air filter housing. Use lint-free cleaning rags.

Re-install the cleaned/new return air filter.

Mount the lid and fasten the securing nut.

Close the panel.



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Never operate the dryer without return air filter.

The dryer can't be put into operation if the panel is not replaced.



Order number return air filter if operated

with return air cooler: ID 88226

without return air cooler: ID 86389

Regeneration air filter

Loosen the securing nut on lid of the regeneration air filter.

Remove the lid and regeneration air filter housing.

Loosen the two wing nuts.

Remove the circular grid.

Remove the filter mat.

Blow through the filter mat with compressed air from the inside to the outside, **or** renew the filter.

Re-install the cleaned/new filter.

Replace the circular grid.

Fasten the two wing nuts on.

Replace the regeneration air filter housing and the lid of the regeneration air filter.

Fasten the securing nut onto the regeneration air filter.

Close the panel.



Never operate the dryer without regeneration air filter.

The dryer can't be put into operation if the panel is not replaced.



Order number filter mat: ID 93686

Filter of the electrical cabinet

Remove the lid of the filter.

Remove the filter mat.

Blow through the filter mat with compressed air from inside to outside **or** renew the filter mat.

Clean the filter housing. Use lint-free cleaning rags.

Re-install the cleaned/new filter mat.

Replace the lid of the filter.



Never operate the dryer without filter mat.



Order number filter mat: ID 87491

5.3. Tensioning the V-belts

Press the "**F2**"-key.

Select "**Dryer off**".

Acknowledge with the ENTER-key.



Wait until the blowers have stopped turning.

Switch off the dryer at the main switch.

Disconnect the power supply.



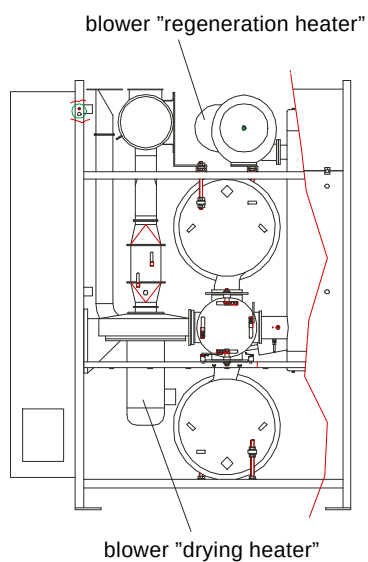
Open the upper left-hand panel (seen from the front) by means of the provided switch cabinet key.



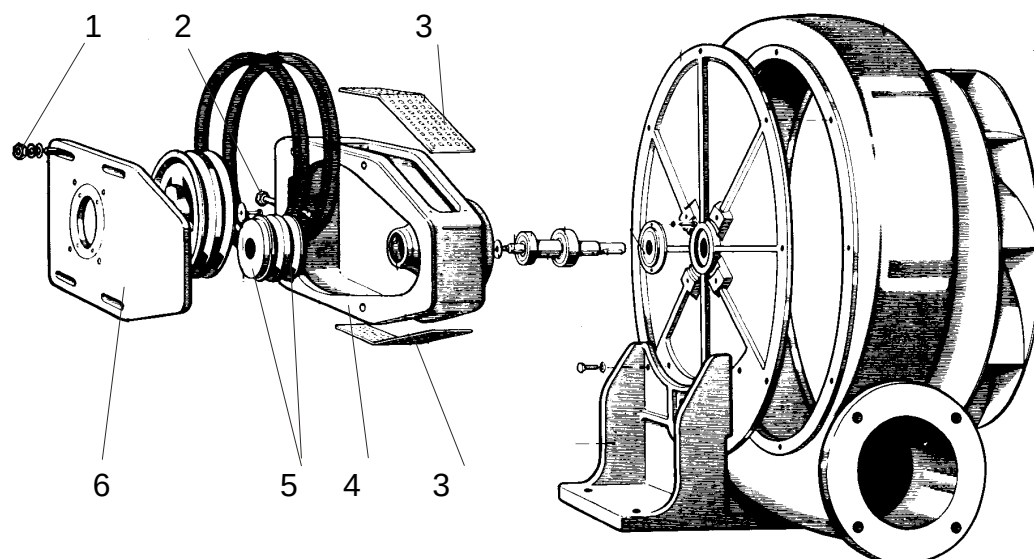
Order number V-belts

blower "regeneration heater": ID 93741

blower "drying heater": ID 83993



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Blower "regeneration heater"

Remove the protective grid of the blower (position 3).

Loosen the nut (position 1).

Loosen and remove the screw (position 2).

Slide motor with carrier flange plate (position 6) towards the carrier flange housing (position 4).

Tension the V-belts by means of screw (position 2) until the belts (position 5) can be pressed in by approx. 3 mm (pressure: 25 N).

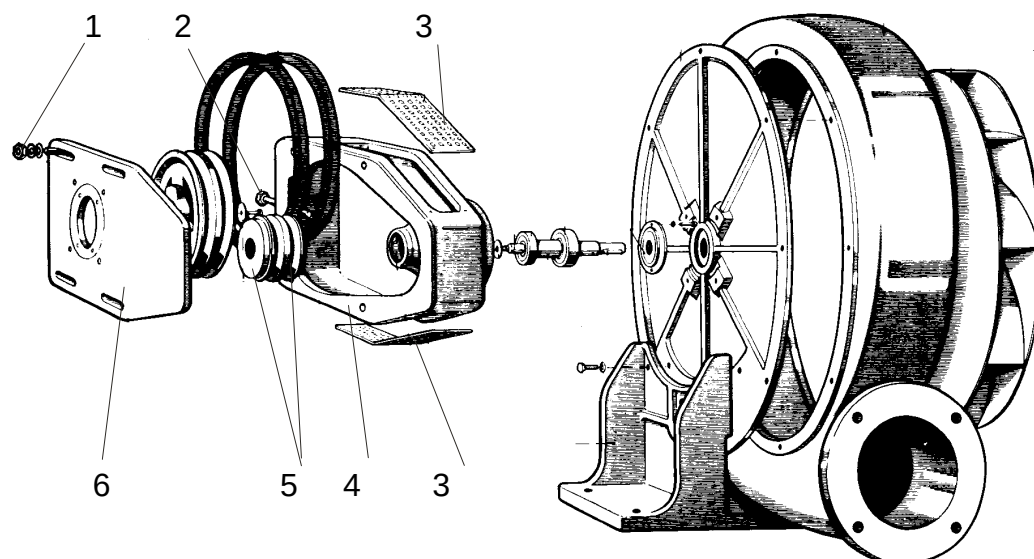
Tighten the nuts on threaded bolt (position 1) again.

Mount the protective grid of the blower (position 2).

Mount the side panels.



Attention should be given to exact alignment of the V-belt pulleys.

Blower "drying heater"

Remove the protective grid of the blower (position 3).

Loosen the nut (position 1).

Loosen and remove the screw (position 2).

Slide motor with carrier flange plate (position 6) towards the carrier flange housing (position 4).

Tension the V-belts by means of screw (position 2) until the belts (position 5) can be pressed in by approx. 3 mm (pressure: 25 N).

Tighten the nuts on threaded bolt (position 1) again.

Mount the protective grid of the blower (position 2).

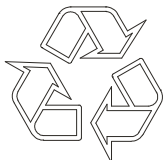
Mount the side panels.



Attention should be given to exact alignment of the V-belt pulleys.

5.4. Disposing of the drying agent

Ensure that drying cells are exchanged by Colortronic or refilled only when empty.



Drying agents must be disposed of in accordance with all official regulations.

Used drying agents are to be disposed of as hazardous waste, as it may be contaminated with foreign substances from the materials dried in the system.



Used drying agents or drying cells containing used drying agent cannot be returned to Colortronic.

5.5. Changing the battery of the control system



This work may be carried through only by qualified personnel trained in the field of electrical engineering.



The battery may be changed only with the control system switched on.

Open the control box by means of the control box key which is part of the supply.

Push down the slide valve of the door to the battery compartment.

Open the door outwards.

Pull the end of the plastic band outwards.



The battery slides from the support and falls out.

Insert the new battery into the battery compartment.



Note the polarity on the back wall of the battery compartment.

Make sure that the plastic band is located to the left of the battery so that its end is freely accessible.

Before inserting the battery, charge it for two hours with 100 Ω (depassivate).

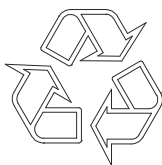
Close the door and lock it by means of the slide valve.

Close the control box.



Order number

battery: ID 85590



Dispose of used batteries as special waste with regard to all government regulations.

6. Technical Data

Version: 64.10-0147GB01 03/98

Volume of dehumidified air: 300 m³/h

Operation voltage: 400 V/3 AC/PEN/50 Hz
Special voltage possible

Connected load*: approx. 15.0 kW
* without hopper heater

Calorific output (regeneration): 12.0 kW

Drive output (drying): 1.1 kW

Drive output (regeneration): 0.5 kW

Min. dew point temperature: approx. -55 °C

Max. dew point temperature: -35 bis -28 °C

Width*: 780 mm

Depth*: 1010 mm

Height*: 2000 mm

* without electrical cabinet

Weight: approx. 500 kg

Noise level: 83 dB (A)

Electrical cabinet:

Width*: 700 mm

Height*: 1800 mm

Depth*: 400 mm

*incl. expansion

Control sub-assembly

Central sub-assembly: S 5-95 U

Inputs: 8

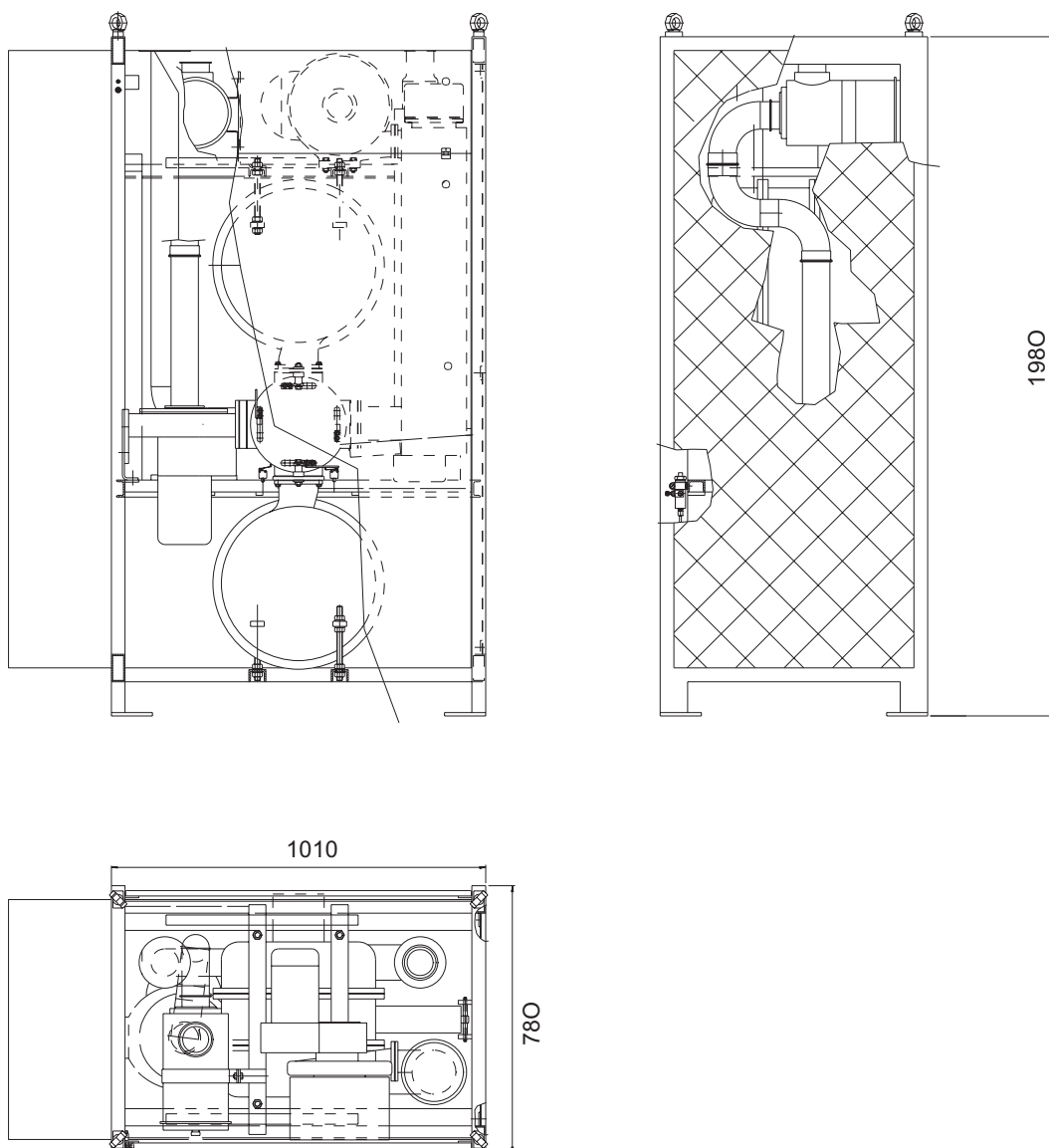
Outputs: 14

Operating unit

Test control unit: Handy OP 7

Display: 4 x 20 Stellen LCD

Dimension sheet



Dimensions in mm. Specifications may be subject to alterations.

7. Spare parts list

Version: 64.10-0148GB01 03/98



This spare parts list is intended to be used only by trained personnel.

Other persons are not permitted to modify or repair the equipment.

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19264	Drying heater (complete)
95828	Tubular heating element 230 V, 3 kW
85276	STB (drying) 160-250 °C
86363	Spindle motor 24 V
19267	Regeneration heater (complete)
85275	STB (regeneration) 360-500 °C
94013	Tubular heating element 230 V, 2 kW
87788	High-pressure blower HRD 1/2, 0,5 kW, 400 V/50 Hz
93741	V-belt High-pressure blower for special voltage on request
87787	High-pressure blower HRD 1/5, 1,1 kW, 400 V/50 Hz
83993	V-belt High-pressure blower for special voltage on request
93687	Fine-mesh filter with filter mat (complete)
93686	Filter mat for fine-mesh filter
97762	Silicon hose
86389	Filter cartridge (if no return air cooler is in use))
85266	Field switch
85264	Moisture sensor
85241	Digital timer (extern, optional)
05190	Valve stem, complete
84156	Fan
84167	Filter
14208	Drying cell, complete
96196	Drying agent

86371	Multiplier Pt 100 (3 m)
89846	Multiplier Pt 100 (6 m)
93303	Multiplier PT 100 (9 m)
86387	Multiplier PT 100 (12 m)
95819	Pull-button
85682	Micro-switch
28257	Control system 400 V/3 AC/50 Hz (complete) Control-system for special voltage on request
85590	Battery S5-95U
85219	Cooling appliance (optional)

Return air cooler (optional)

29787	Return air cooler
87099	Solenoid valve 24 V
84503	Temperature converter
88226	Filter cartridge, temperature-proof (if a return air cooler is in use)

Flaps (optional)

16522	Motor flap NW150, complete
16517	Motor flap NW80, complete
86376	Motor operator 24 V, AD/DC, 50-60 Hz
18232	Air control flap
84492	Thermometer

Hopper heaters (optional)

26099	Housing (1.5 kW)
85343	Radiator (1.5 kW)
26100	Housing (3 kW)
85338	Radiator (3 kW)

8. Electrical manual

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This electrical manual is intended to be used only by Colortronic service personnel and trained personnel authorized by Colortronic.

Other persons are not permitted to modify or repair the equipment.

9. Accessories

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